1/5

Fig.1

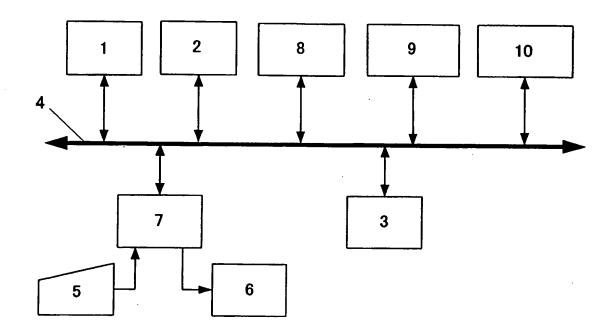
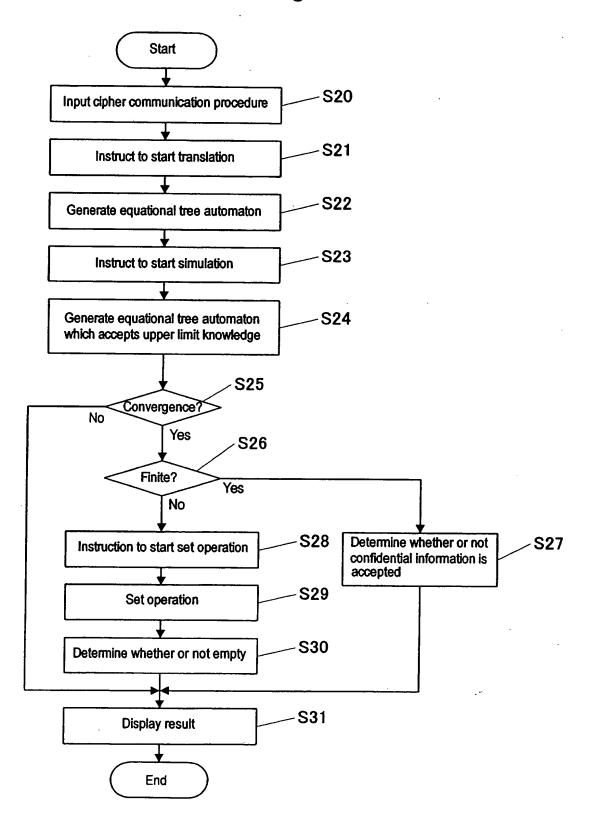


Fig.2



## Fig.3

Designate input/output argument

Input l o r: Rewriting rule

 $\mathcal{A}/\mathsf{AC}$ : Equational tree automaton

Output  $\mathcal{B}_{l o r}/\mathsf{AC}$ : Equational tree automaton

Initial setting

$$A_0 := A; i := 0; j := 0;$$
 $S := pos(l);$ 
 $T := pos(r);$ 

First process

Second process

while 
$$S \neq \varnothing$$
 do Select element p which satisfies the following condition from S:  $\forall p' \in S. \ p \succeq p'$  Calculate equational tree automaton  $\mathcal{A}_{i+1}/\mathsf{AC}$  which satisfies the following condition when  $l_{|p} = f(t_1, \ldots, t_n)$  
$$\mathcal{L}(\mathcal{A}_{i+1}/\mathsf{AC}) = (\{\rightarrow_{\{f(c_{t_1}^{p+1}, \ldots, c_{t_n}^{p+n}) \rightarrow c_{l_{|p}}^p\}/\mathsf{AC}})[\mathcal{L}(\mathcal{A}_i/\mathsf{AC})]$$
  $i := i+1;$   $S := S - \{p\};$  od Calculate equational tree automaton  $\mathcal{B}_0/\mathsf{AC}$  which satisfies the following condition

 $\mathcal{L}(\mathcal{B}_0/\mathsf{AC}) = (\{\rightarrow_{\{c_i^e \rightarrow d_r^e\}/\mathsf{AC}})[\mathcal{L}(\mathcal{A}_i/\mathsf{AC})]$ 

while 
$$T \neq \varnothing$$
 do Select element q which satisfies the following condition from T:  $\forall q' \in T. \ q' \succeq q$  Calculate equational tree automaton  $\mathcal{B}_{j+1}/\mathsf{AC}$  which satisfies the following condition when  $r_{|q} = f(t_1, \ldots, t_n)$  
$$\mathcal{L}(\mathcal{B}_{j+1}/\mathsf{AC}) = (\{\rightarrow_{\{\mathsf{d}^q_{r|q} \rightarrow f(\mathsf{d}^{q\cdot 1}_{t_1}, \ldots, \mathsf{d}^{q\cdot n}_{t_n})\}/\mathsf{AC}})[\mathcal{L}(\mathcal{B}_{j}/\mathsf{AC})]$$
  $j := j+1;$   $T := T - \{q\};$  od 
$$\mathcal{B}_{l \rightarrow r} := \mathcal{B}_{j};$$

return  $\mathcal{B}_{l\to r}/AC$ 

Fig.4

Set	Transition rule	Condition
$\mathcal{R}_{x}$	$f((p_1,q_1),\ldots,(p_n,q_n)) o (p,q)$	$orall f \in \mathcal{F} \setminus \mathcal{G} \ orall f(p_1, \dots, p_n)  ightarrow p \in \mathcal{R}_{\mathcal{A}} \ orall f(q_1, \dots, q_n)  ightarrow q \in \mathcal{R}_{\mathcal{B}}$
$\mathcal{R}_{\overline{\mathcal{A}}}$	$g((p_1, q_1), (p_2, q_2)) \rightarrow g((p, q_1), q_2)$ $g(p_1, (p_2, q_2)) \rightarrow (p, q_2)$	$egin{array}{l} orall g \in \mathcal{G} \ orall q_1, q_2 \in \mathcal{Q}_{\mathcal{B}} \ orall g(p_1, p_2)  ightarrow p \in \mathcal{R}_{\mathcal{A}} \end{array}$
	$g((p_1,q_1),(p_2,q_2)) \to g((r_1,q_1),(r_2,q_2))$ $g(p_1,(p_2,q_2)) \to g(r_1,(r_2,q_2))$	$orall g(p_1,p_2)  ightarrow g(r_1,r_2) \in \mathcal{R}_{\mathcal{A}}$
$\mathcal{R}_{\overline{\mathcal{B}}}$	$g((p_1,q_1),(p_2,q_2))  o g((p_1,q),p_2) \ g(q_1,(p_2,q_2))  o (p_2,q)$	$egin{array}{l} orall g \in \mathcal{G} \ orall p_1, p_2 \in \mathcal{Q}_{\mathcal{A}} \ orall g(q_1, q_2)  ightarrow q \in \mathcal{R}_{\mathcal{B}} \end{array}$
	$g((p_1,q_1),(p_2,q_2))  ightarrow g((p_1,r_1),(p_2,r_2)) \ g(q_1,(p_2,q_2))  ightarrow g(r_1,(p_2,r_2))$	$orall g(q_1,q_2)  o g(r_1,r_2) \in \mathcal{R}_{\mathcal{B}}$
$\mathcal{R}_{\mathcal{G}}$	$egin{aligned} g((p,q_1),q_2) & o g(q_1,(p,q_2)) \ g((p_1,q),p_2) & o g(p_1,(p_2,q)) \ g(q,p) & o (p,q) \end{aligned}$	$egin{array}{l} orall g \in \mathcal{G} \ orall p_1, p_2, p \in \mathcal{Q}_{\mathcal{A}} \ orall q_1, q_2, q \in \mathcal{Q}_{\mathcal{B}} \end{array}$

Fig.5

